

**REMARKS:**

Claims 1-37 are pending. By this Submission, claims 1, 6, and 25 are amended, thereby leaving claims 2-5, 7-24, and 26-37 unchanged.

Claims 1, 6, and 25 have been amended to correct typographical errors found by the Applicants. These amendments do not affect the scope of the claims.

Claims 1-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,948,353 ("Lawrence"). More particularly, the Examiner rejects claims 1-37 by making the following contentions:

1. Lawrence discloses overlapping wt% ranges of those claimed in claims 1-37 of the present Application; such overlap rendering the claimed subject matter prima facie obvious because it would be obvious to one of ordinary skill in the art to select the claimed alloy ranges from the broader disclosure of the prior art (Lawrence) since the prior art (Lawrence) has the same utility (brake drum) and similar properties of high strength and wear resistance (Office Action dated April 26, 2005);

2. Even though the prior art does not teach Type A flake graphite and carbon equivalent of about 4.1 to about 4.25% as recited in one or more of the claims, such would be expected since the compositional limitations are closely met and in absence of proof to the contrary (Office Action dated April 26, 2005);

3. Although Lawrence preferably teaches 0.2 to 0.5% chromium (Cr), its broad teaching does not include Cr and hence would meet Applicants' dependent claims reciting less than [0.2]% Cr (Office Action dated April 26, 2005);

4. Lawrence does not teach Magnesium (Mg) and therefore would be present at impurity levels similar to less than 0.005% Mg or less than 0.001% Mg recited by Applicants dependent claims (Office Action dated April 26, 2005);

5. Since Applicants have not demonstrated (e.g., by comparative test data) that the more narrowly claimed Mo and Cu ranges are somehow critical and productive of new and unexpected results, the claims do not patentably distinguish over the prior art (Office Action dated August 17, 2005); and

6. Applicant amended independent claims to recite "consisting essentially of" to exclude the tin (Sn) content of 0.02 to 0.07% taught by Lawrence. It is the Examiner's position

that this difference is merely the omission of an element with the obvious consequent loss of its function which would not patentably distinguish the claims over the prior art (Office Action dated August 17, 2005).

Applicants will address each contention individually. Since the Examiner did not address any particular claim(s) when making the above contentions, Applicants will address the relevant claims where the contention is believed to be specifically applicable and will address the contentions generally where the contention appears to be directed to all claims.

Submitted herewith is a Declaration of Laxmi C. Tandon pursuant to 37 C.F.R. §1.132 (the "Declaration"), which will be referenced herein. Laxmi C. Tandon is a joint inventor of the subject matter claimed in claims 1-37.

#### Contention 1

Lawrence discloses overlapping wt% ranges of those claimed in claims 1-37 of the present Application; such overlap rendering the claimed subject matter prima facie obvious because it would be obvious to one of ordinary skill in the art to select the claimed alloy ranges from the broader disclosure of the prior art (Lawrence) since the prior art (Lawrence) has the same utility (brake drum) and similar properties of high strength and wear resistance.

The Examiner's basis for stating that claims 1-37 are obvious in view of Lawrence is that "the prior art has the same utility and similar properties of high tensile strength and wear resistance." Applicants respectfully disagree with this statement. The inventions of the present Application and Lawrence have different properties. Particularly, Lawrence discloses gray iron compositions with increased wear resistance and hardness, while on the other hand the present Application discloses gray iron alloys with high tensile strength relative to conventional gray iron. The gray iron alloys of the present Application also maintain machineability and thermal properties comparable to conventional gray iron. Lawrence's gray iron compositions with increased wear resistance and hardness lack the machineability of conventional gray iron and, in fact, have decreased machineability.

In addition, one of ordinary skill in the art of gray iron would recognize that the present Application and Lawrence disclose gray iron compositions with different properties. For support,

reference is made to the attached Declaration where the differences in properties between the present Application and Lawrence are clearly identified. See ¶10 and ¶12 of the Declaration.

For these and other reasons, the inventions of the present Application and Lawrence do not have similar properties, and this basis for the Examiner's rejection should be withdrawn.

Also, with reference to the Declaration, numerous reasons are set forth to patentably distinguish claims 1-37 from Lawrence and illustrate that claims 1-37 are not obvious in view of Lawrence. See ¶10-¶20 of the Declaration.

### Contention 2

Even though the prior art does not teach Type A flake graphite and carbon equivalent of about 4.1 to about 4.25% as recited in one or more of the claims, such would be expected since the compositional limitations are closely met and in absence of proof to the contrary.

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of presenting a *prima facie* case of obviousness based upon the prior art. In re Fritch, 972 F.2d 1260, 1265, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); In re Fine, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference(s) themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference(s) or to combine reference teachings. In re Vaeck, 947 F.2d 488, 493, 20 U.S.P.Q. 2d 1438, 1442 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. Id. Third, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 985, 180 U.S.P.Q. 580, 583 (CCPA 1974); MPEP §§706.02(j), 2143.03.

Although Applicants believe the Examiner has not satisfied any of the three criteria required to establish a *prima facie* case of obviousness, only the third criteria will be addressed herein since the Examiner's contention relates specifically to limitations not taught in the prior art. Applicants believe that the Examiner is relying upon Lawrence as the "prior art", and therefore, Lawrence must teach or suggest all of the claim limitations of Claims 1-37 to establish a *prima facie* case of obviousness. In the Office Action dated April 26, 2005, the Examiner conceded that Lawrence does not disclose all of the claim limitations of claims 1-37 and, more particularly, that

Type A flake graphite and a carbon equivalent of about 4.1% to about 4.25% is not disclosed in Lawrence. Either a type A flake graphite or a carbon equivalent of about 4.1% to about 4.25% (or both) is recited in each of independent claims 1, 11, 18, 19, 20, and 34. Accordingly, the Examiner has not established a prima facie case of obviousness of claims of independent claims 1, 11, 18, 19, 20, and 34 and, therefore, also fails to establish a prima facie case of obviousness of claims 2-10, 12-17, 21-33, and 35-37 that respectively depend from independent claims 1, 11, 18, 19, 20, and 34.

The Examiner attempts to supplement the untaught claim limitations of type A flake graphite and a carbon equivalent of about 4.1% to about 4.25% by stating that such would be expected because the compositional limitations are closely met and in absence of proof to the contrary, without providing any evidentiary support of "expectation" or that the limitations are "closely met". In fact, however, it is the Examiner who should provide proof to support such a contention. Deficiencies of references cannot be saved by appeals to "common sense" and "basic knowledge" without any evidentiary support. In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001). Accordingly, the Examiner's contention to supplement the untaught claim limitations of type A flake graphite and a carbon equivalent of about 4.1% to about 4.25 is improper.

In fact, as stated in the Declaration, particularly ¶10 and ¶17, Lawrence does not teach, suggest, or make obvious the carbon equivalent ranges of claims 1-37 because Lawrence has no need for a high tensile strength gray iron, and Applicants' claimed range of carbon equivalent has a cooperative effect with other elements in the gray iron alloy to produce new and unexpected results.

Therefore, Applicants respectfully request withdrawal of the rejection of claims 1-37.

### Contention 3

Although Lawrence preferably teaches 0.2 to 0.5% chromium (Cr), its broad teaching does not include Cr and hence would meet Applicants' dependent claims reciting less than [0.2]% Cr.

This contention relates to dependent claims 8, 15, 29, and 35, which respectively depend from independent claims 1, 11, 20, and 34. For reasons described herein and the Declaration, independent claims 1, 11, 20, and 34 are allowable and dependent claims 8, 15, 29, and 35 are allowable for the same and other reasons. Accordingly, this contention relating to only dependent

claims will not be discussed in detail herein in view of the allowability of independent claims 1, 11, 20, and 34.

#### Contention 4

Lawrence does not teach Magnesium (Mg) and therefore would be present at impurity levels similar to less than 0.005% Mg or less than 0.001% Mg recited by Applicants dependent claims.

This contention relates to dependent claims 9, 10, 16, 17, 30, 31, 36, and 37, which respectively depend from independent claims 1, 11, 20, and 34. For reasons described herein and the Declaration, independent claims 1, 11, 20, and 34 are allowable and dependent claims 9, 10, 16, 17, 30, 31, 36, and 37 are allowable for the same and other reasons. Accordingly, this contention relating to only dependent claims will not be discussed in detail herein in view of the allowability of independent claims 1, 11, 20, and 34, except as described below.

The Examiner's conclusion in the above contention appears to be a non sequitur. Particularly, the Examiner states that Lawrence does not teach Mg. Then, the Examiner makes the conclusion that Mg is present in the composition at impurity levels. Applicants do not understand how the absence of teaching an element can imply the presence of the untaught element in a composition. This is clearly improper.

#### Contention 5

Since Applicants have not demonstrated (e.g., by comparative test data) that the more narrowly claimed Mo and Cu ranges are somehow critical and productive of new and unexpected results, the claims do not patentably distinguish over the prior art.

Applicants have now demonstrated how the more narrowly claimed Mo and Cu ranges are productive of new and unexpected results, as described in the Declaration. The Declaration sets forth numerous reasons and comparative test data that establish that the more narrowly claimed ranges of Mo and Cu are not obvious in view of Lawrence. For example, the claimed ranges of Mo and Cu produce desired high tensile strength without high failure rates for the gray iron. Particular reference is made to ¶10-¶16 of the Declaration. Accordingly, for these and other reasons, claims 1-37 patentably distinguish over Lawrence and are allowable.

### Contention 6

Applicant amended independent claims to recite “consisting essentially of” to exclude the tin (Sn) content of 0.02 to 0.07% taught by Lawrence. It is the Examiner’s position that this difference is merely the omission of an element with the obvious consequent loss of its function which would not patentably distinguish the claims over the prior art.

Independent claims 1, 11, 18, 19, 20, and 34 include the language “consisting essentially of”, which limits the scope of a claim to exclude Sn and Cr. See *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354, 48 U.S.P.Q.2d 1351, 1353-54 (Fed. Cir. 1998) (the term “consisting essentially of” refers to a composition that “includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention”). On the other hand, Lawrence discloses compositions that have materially different chemistries from the compositions claimed in independent claims 1, 11, 18, 19, 20, and 34 and in particular, Lawrence discloses gray iron compositions that include one or both of Sn and Cr. Lawrence teaches that the castings formed of the gray iron compositions of the invention, including at least one or both of Sn and Cr, “exhibit moderately increased hardness...[and] the level of tin included in the composition creates a finer microstructure [and]...[t]he higher levels of Cr...are believed to contribute to the increased hardness...of the gray iron compositions.” Lawrence, Col. 3, Lines 9-28. According to Lawrence, both Sn and Cr have a material effect on the basic and novel properties of the compositions disclosed in Lawrence and, therefore, would have a material effect on the basic and novel properties of the gray iron alloys disclosed in the Application if added thereto. Consequently, the presence of one or both of Sn and Cr disclosed in every composition of gray iron in Lawrence cannot be ignored or minimized when attempting to use Lawrence to reject claims 1-37. Likewise, the omission of Sn and Cr in the pending claims cannot be ignored and for these and other reasons as described in ¶20 of the Declaration, claims 1-37 are not obvious in view of Lawrence.

In this contention, the Examiner also argues that by omitting Sn, Applicant has omitted “an element with the obvious consequent loss of its function”. Applicants respectfully disagree with this statement made by the Examiner. The function of Sn in gray iron compositions is to promote pearlitic matrix structures. See the Declaration ¶20. With reference to Appendix D of the

Declaration, the gray iron alloys claimed and disclosed in the Application have a fully pearlitic matrix structure that was achieved *without adding Sn*. Sn would have little effect on the base gray iron alloys because the microstructure of the gray iron alloys claimed and disclosed in the Application are already fully pearlitic. In other words, no function is lost by the omission of Sn (as contended by the Examiner). Accordingly, the Examiner's position regarding Sn does not apply to the claimed gray iron alloys of the Application.

For the reasons set forth in this Submission, the reasons set forth in the Declaration, and others, Lawrence does not teach, suggest, or make obvious the subject matter of claims 1-37.

### CONCLUSION

In view of the foregoing, entry of the present RCE, Submission, and Declaration, and allowance of claims 1-37 are respectfully requested.

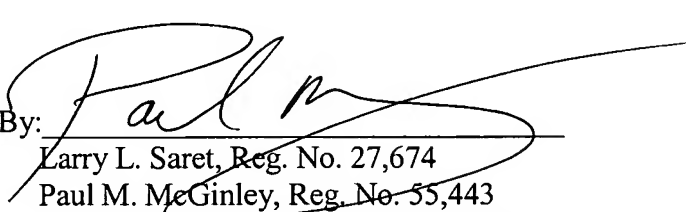
The undersigned is available for telephone consultation during normal business hours.

Respectfully submitted,

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